

What is claimed is:

1. A continuous processing apparatus for high temperature thermal treatment of granular materials comprising:

a vertical conveyor means with an internal feed mechanism for transporting granular feedstock upward;

an external export means for taking reacted product downward wherein said product heats said granular feedstock by absorbing heat from the product flowing downward through said export means; and

a heating means disposed around a top portion of said vertical conveyor means and said external export means.

2. The apparatus of claim 2 further comprising gas control means disposed in said heating means so that volatile gases produced by said thermal treatment can be removed from the product.

3. The apparatus of claim 2 further comprising a feed conveyor that provides granular feedstock to the lower portion of the vertical conveyor means.

4. The apparatus of claim 3 where the vertical conveyor means comprises;

a metal vertical heater intake tube;

a screw conveyor disposed in said heater intake tube that is rotatable in order to transport granular feedstock upward through said vertical intake tube; and

a heat resistant tube communicating with the top of said vertical heater intake tube that extends into said heating means.

5. The apparatus of claim 4 wherein said heat resistant tube is made of graphite.

6. The apparatus of claim 5 wherein said graphite heat resistant tube is conical in cross section with increasing radius from bottom to top of said heat resistant tube.

7. The apparatus of Claim 6 where said apparatus has a bottom cooling portion, a middle insulated portion and a top heating portion.

8. The apparatus of claim 7 wherein said cooling bottom portion has external water cooling means.

9. A continuous thermal processing apparatus for conversion of granular coke to graphite granular material comprising:

a vertical conveyor means with an internal feed mechanism for transporting granular coke feedstock upward;

an output tube for taking reacted granular product downward wherein said internal feed heats said granular feedstock by absorbing heat from the reacted granular feedstock flowing downward through said export means; wherein said internal feed mechanism comprises:

a vertical intake column with an feedstock entry disposed at the lower end of said vertical tube and a mechanical means for transporting said feedstock upward to the top of said;

a heat resistant column extending from the top of said first vertical column made of heat compatible material; and

heating means disposed at the top portion of said heat resistant column where heating means that would allow granular coke feedstock to be heated to high temperature above 2000 degrees centigrade.

10. The apparatus of 9 wherein said heating means also has gas flow means so that volatile gases produced by heating said granular coke feedstock may be removed as said feedstock is being graphitized.

11. The apparatus of claim 10 wherein said heat resistant column has an increased radius on the end distal from said first vertical column.

12. The apparatus of claim 10 wherein said heating means is an inductive heating chamber.

13. The apparatus of claim 9 wherein said heat resistant column is made from high temperature ceramic material.

14. The apparatus of claim 9 wherein said output tube is a gravity fed column formed around said internal feed mechanism and said outer surface of output tube is water cooled.

15. The apparatus of claim 12 wherein the outer portions of said heating means are insulated from an inductive coil and from a graphite susceptor.

16. The apparatus of claim 9 wherein said apparatus has a bottom cooling portion, a middle insulated portion and a top heating portion.

17. A method for high temperature thermal treatment of granulated material comprising:

continuously providing a supply of granulated feedstock to the bottom portion of a vertical conveyance means;

continuously controlling the atmosphere into said vertical conveyance means;

transporting said feedstock into a heating section maintained at least 2000 degrees centigrade;

transferring said feedstock into a gravity fed means designed to keep said feedstock in said heating section for a determined period of time to allow thermal conversion of said feedstock into granular product; and

transporting said granular product past a heat transfer wall so that said granular product transfers energy to said granulated feedstock.

18. The method of claim 17 wherein when said feedstock is in said heating section nitrogen gas is continuously exchanged over the top of said feedstock flow to remove volatiles.

19. A method for high temperature thermal treatment of granulated coke comprising:

continuously providing a supply of granulated coke to the bottom portion of a vertical conveyance means;

continuously controlling the atmosphere into said vertical conveyance means;

transporting said granulated coke into a heating section maintained at least 2500 degrees centigrade;

transferring said granulated coke into a gravity fed means designed to keep said granulated coke in said heating section for a determined period of time to allow thermal conversion to granulated coke; and

transporting said granulated coke past a heat transfer wall so that energy is transferred to said granulated coke.

20. The method of claim 19 wherein when said granulated coke is in said heating section a gas chosen from nitrogen or argon is continuously exchanged over the top of said granulated coke to remove volatiles produced by the high temperature.